

Historic, Archive Document

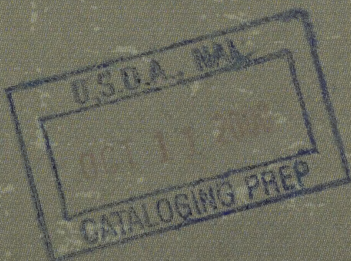
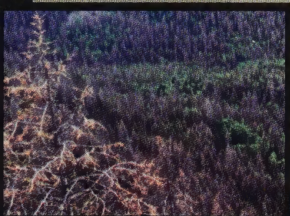
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Why are these *trees* dying?

Thousands of
spruce trees have
died, losing their
needles and
turning brown at
the higher
elevations on
the Markagunt
Plateau, Dixie
National Forest.



**Why are
they dying?**



US Department of Agriculture • Forest Service
Intermountain Region • Dixie National Forest

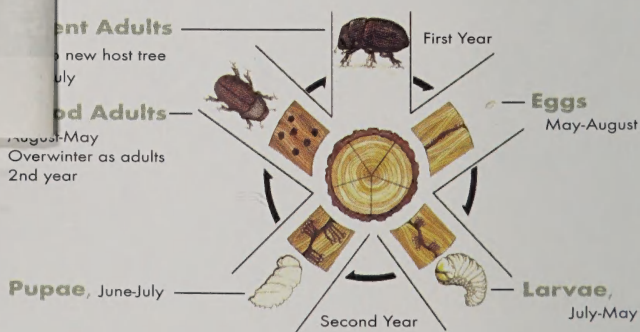
Little *beetles*, big change

Spruce bark beetles are native to the Markagunt Plateau, and to many spruce forests throughout the world. Most of the time, beetle populations are very low (endemic). They prefer down trees, infesting pockets of windfall or areas where trees are being cut for activities such as road construction and home building.

When forest conditions are right--lots of big, old spruce trees growing closely together--these endemic populations can expand to epidemic levels.

Just *looking* for a place to call *home*

Spruce bark beetles (*Dendroctonus rufipennis*) are just one species of bark beetle in the forest. They live most of their lives under the bark of a spruce tree. They bore through the bark and lay their eggs in tunnels (called galleries)



The spruce bark beetle lives under the bark for two years while it grows from an egg to an adult beetle.

they have chewed in the cambium layer. The cambium layer transports and stores food and water for the tree.

When the eggs hatch, the larvae feed on the cambium tissue. When they reach adulthood, they emerge to locate a new uninfested host tree where they can lay their eggs. When a beetle locates a suitable tree, it releases a pheromone (*a scent*) that other beetles can detect. The pheromone acts like a vacancy sign, attracting more beetles to the tree.



The impact of the bark beetle in Yankee Meadow.

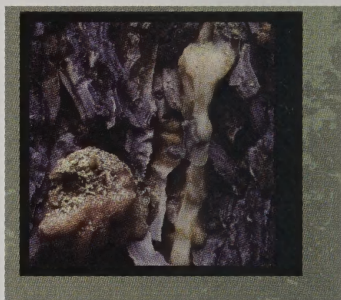
Trees *fight* back

A healthy tree's best defense against bark beetles is its sap. As a beetle bores into the tree, it drowns in the sap that oozes from the wound. During an epidemic, thousands of beetles may infest a tree -- too many for a tree to resist with its sap. The beetles' galleries cut off the flow of nutrients and water, killing the tree.

How can I tell if a tree is infested?

At first, attacks by spruce bark beetles are difficult to detect because the trees don't fade until the second year following the attack. The needles turn a pale green and then brown before falling off the tree. Infested trees have dry boring dust, similar to fine sawdust, in bark crevices and around the base of the tree, and they often have areas with dripping sap (called "pitch tubes").

A pitch tube, where the tree oozes pitch to protect itself.



People and the forest

We have taken action to manage the effects of the spruce bark beetle epidemic. Many dead trees are being harvested to



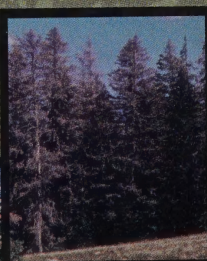
reduce fuel in the event of a fire. These trees provide wood products for lumber and log homes. Funds from these timber sales are used to plant seedlings to aid in the forest recovery.

Fires are being ignited when weather conditions allow us to control their size and behavior. These fires create breaks in vegetation, reducing the risk that large fires will sweep through the area. Fire releases nutrients to the soil, and encourages trees that need fire to regenerate, such as aspen.

We have applied insecticides to trees in campgrounds and other high-value areas. (The scope of an epidemic is too great to make wide use of this expensive treatment.)

Other areas are being left undisturbed, because dead trees provide valuable wildlife habitat. The trees will eventually fall and decompose, providing nutrients to the soil.

This is an opportunity to witness the renewal of the forest. On future visits watch for the young trees and wildflowers that appear among the dead spruce. See how the forest and its inhabitants respond to change.



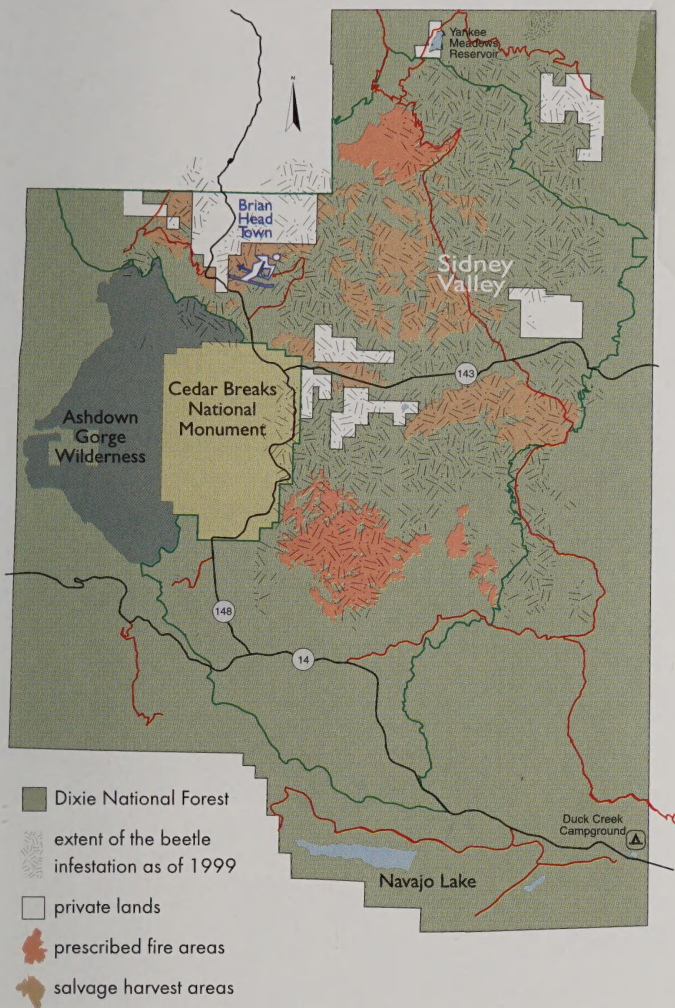
A new *beginning* for the *forest*



In the 1920's
there was a
similar spruce
bark beetle
epidemic on
Boulder Mountain
near Teasdale,
Utah. Today we
can see a young,
vigorous forest.



Today on the
Cedar City
Ranger District
we can witness
the effects of
the spruce bark
beetle as an
agent of change.



For more information

Contact the **Dixie National Forest** at (435) 865-3700,
82 North 100 East, Cedar City, UT 84720

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What has *happened* to the *trees*?

As you travel through the spruce forest on the Markagunt Plateau you will see many dead spruce trees - trees that have been killed by spruce bark beetles. Like fires, spruce bark beetles are agents of renewal in an old forest. These insects are tiny - no larger than a grain of rice - but powerful in numbers. In areas where the spruce bark beetle epidemic is present, most of the mature spruce trees have died. Some of these trees have been harvested or have blown down in strong winds. Others are losing their needles but remain standing.